

Teeth-supported Overdenture – An Alternative Treatment Modality in Different Partially Edentulous Situation – Case Series

Baisakhi Mallick*, Mandira Ghosh, Srija Santra

Department of Prosthodontics and Crown and Bridge, Dr R Ahmed Dental College and Hospital, Kolkata, West Bengal, India.

Abstract

Tooth loss causes an esthetic, functional, and psychological impairment that may reduce the patient's self-esteem and quality of life. In India, there is a high prevalence of adult patients requiring prosthetic treatment due to partial or total tooth loss but prosthetic treatment requirements may vary according to patient condition and needs. Overdenture is one of the prosthetic treatment modalities in replacing missing teeth. The natural teeth or an implant can give support as well as provide the retention and stability of the prosthesis. Tooth-supported overdenture along with attachments can enhance the retention and stability and also decreases alveolar bone resorption. Another important advantage of tooth supported overdenture over implant-supported overdentures is that it is more cost-effective and it also preserves more dental proprioception. However, proper oral hygiene maintenance is required to avoid failures. An appropriate diagnosis of abutment and treatment planning is also required for satisfactory long-term result.

Keywords: Overdenture, Alternate treatment modality, Proprioception, Partial edentulous situation.

INTRODUCTION

Preservation of remaining healthy tooth and oral structure is the utmost important factor for any prosthodontic treatment modality. In 1856, Ledger described prosthesis resembling an overdenture and in 1888 Evans described a method of using roots to retain restorations.^[1] The main advantages of such treatment are proprioception and the preservation of the remaining tooth structure and^[2] preservation of alveolar bone increase masticatory efficiency as well as the psychological boost up of the patient.^[3] Although treatment with implant supported overdenture become popular now a days, cost-effectiveness, tactile sensation, and non-surgical approach with tooth-supported overdenture has much acceptance in developing countries.^[4] In these case reports, teeth abutments acting as an aid, to support overdenture is discussed.

CASE REPORTS

In the first case, a 65-year-old male patient reported with the complaint of difficulty in chewing food. He was unsatisfied with previous partial dentures. On intraoral examination, it was found that few teeth were present in the maxillary (13, 11, 21, and 27) and mandibular arch (33 and 47). The patient was explained for various treatment options including option of implant supported overdenture. However, the patient

disagreed for that treatment procedure. Hence, it was planned to retain the remaining teeth of both arch and use them as overdenture abutments as the location of the remaining teeth was favorable for the overdenture abutments. Patient's consent was taken. Following root canal treatment (RCT) of 13, 11, 21, 27, 33 tooth preparations (13, 11, 21, 27, and 33) were performed. As 47 was mesial angulated, it was decided to keep 47 as such. Post-spaces (13, 11, 21, and 33) were prepared (Figure 1a and b). After post-space formation, impression of the posts (Figure 1c and d) was taken by medium body elastomeric impression material in single step on custom made special tray in upper arch and lower arch (Figure 1e). The impressions of both arches along with impression of posts were carefully poured by Type V die stone (Figure 1f). Metal posts were fabricated with metal coping. After checking in patient's mouth, those coping with post were cemented by glass ionomer cement (GIC) (Figure 2a and b). In the next day, impression of both arches was taken to make master cast

Address for correspondence:

Dr. Baisakhi Mallick, Department of Prosthodontics and Crown and Bridge,
Dr R Ahmed Dental College and Hospital, Kolkata, West Bengal, India.
Email: mallickbaisakhi2@gmail.com

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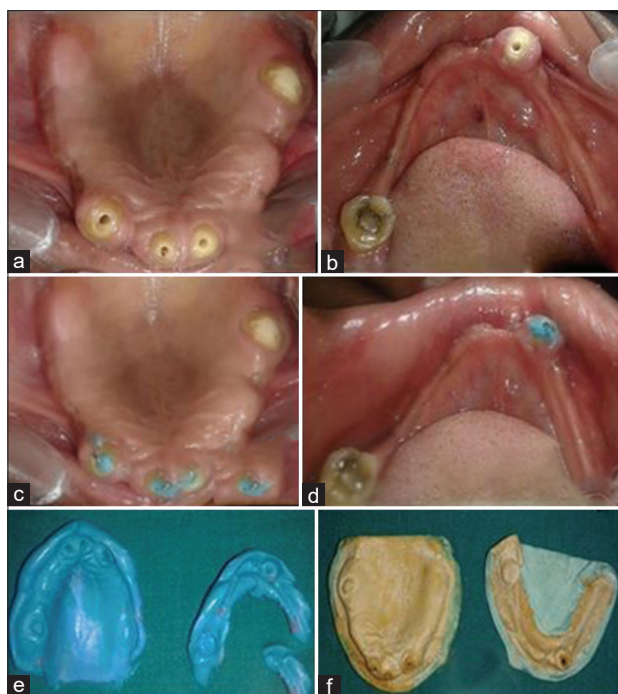


Figure 1: (a) Intraoral view of post-space preparation of 13, 11, and 21. (b) Intraoral view of post-space preparation of 33. (c) Impression for mental post fabrication of 13, 11, and 21 with light body and ss wire. (d) Impression for metal post-fabrication of 33 with light body and ss wire. (e) Single step impression of both arch with elastomeric impression material along with impression of posts. (f) Final cast after pouring with die stone



Figure 2: (a) Metal coping in 27 and coping with post luted in 13, 11, and 21. (b) Metal coping with metal post luted in 33. (c) Facebow transfer after fabrication of occlusal rim. (d and e) Final prosthesis with intaglio surfaces. (f) Occlusion in patient's mouth. (g) Intraoral view of maxillary and mandibular teeth prior treatment with overdenture. (h) Patient's satisfaction with overdenture

and to fabricate occlusion rim. Following facebow transfer (Figure 2c), vertical dimension of the patient was recorded and cast was articulated. After teeth setting trial was taken. After processing (Figure 2d and e), the upper and lower overdenture (Figure 2f) were inserted in the patient's mouth and checked the occlusion. Periodic follow-up was carried out. Patient (Figure 2g and h) was quite satisfied with his overdentures.

In the second case, a 69-year-old male patient reported to the dental OPD with completely edentulous maxillary arch and partially edentulous (Figure 3a) mandibular arch (only 33, 44 was present). After discussing with the patient, it was suggested to give him complete denture in maxillary arch and overdenture in the mandibular arch as he was unwilling for extraction. Hence, the patient had undergone RCT of 33 and 44. Preliminary impression was taken with impression compound in maxillary arch. Then, custom tray was fabricated for maxillary arch. Following RCT (Figure 3b), teeth preparation in relation to 33 and 44 was done to receive metal coping (Figure 3c). After cementation of metal coping (Figure 3d and e), final impression was taken using light body and putty consistency elastomeric impression material in mandibular arch (Figure 3f and g). After border moulding, final impression maxillary arch (Figure 3h) was taken with Zinc oxide eugenol impression paste material. After pouring of the cast occlusal rim (Figure 4a) were prepared,

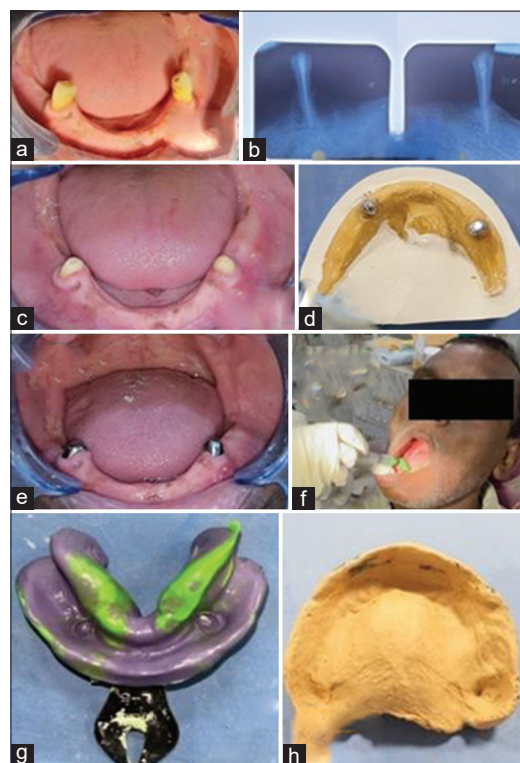


Figure 3: (a) Intraoral view of lower arch. (b) IOPA X-ray view of 33, 44 after RCT. (c) Teeth preparation of 33, 44. (d) Metal coping fabrication in the laboratory. (e) Metal coping lute by GIC in the patient mouth. (f) Placing of light body on the prepared teeth surface before impression with tray. (g) Impression of lower arch with coping by putty and light body elastomeric impression material. (h) Final impression of upper complete edentulous arch

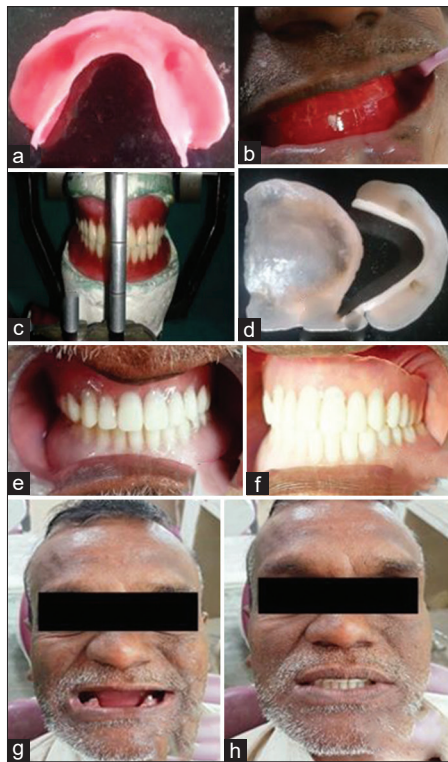


Figure 4: (a) Intaglio surface of lower occlusal rim. (b) Occlusal rim in patient's mouth. (c) Teeth setting in articulator. (d) Intaglio surface of upper CD and lower tooth supported Overdenture. (e) Final prosthesis in occlusion. (f) Lateral view of prosthesis in patient's mouth. (g and h) Patient's facial profile before and after post-insertion in follow-up

vertical dimension of the patient was recorded, centric relation was taken and cast was articulated (Figure 4b). After teeth setting (Figure 4c), trial was taken. After processing (Figure 4d), the upper complete denture and lower overdenture was inserted and checked the occlusion (Figure 4e and f). Patient was delighted (Figure 4g and h) with that treatment outcome.

DISCUSSION

Tooth loss significantly affects the masticatory performance and bone turn over. Carlsson in 2014 claimed that the simplest way to prevent bone loss is to avoid extraction of all teeth in his survey.^[5] Shah, *et al.* claimed that immediate complete overdentures by tooth or implant supported prosthesis is recommended than totally mucosal supported prosthesis.^[6] In addition, two canines are used because of their location is in the middle of the arch and they have long roots. In our case reports, we used canine, premolars, and molars for coping as their periodontal conditions were healthy. A lot of techniques used to serve as abutment for overdenture ranges from simple tooth modification and reduction and endodontic therapy followed by tooth preparation with cast coping utilizing some form of attachments.^[7] The short coping design showed least amount of stress than any of the other design like tapered coping design and tapered coping with occlusal bearing design.

This design helps in maintenance of oral hygiene and it reduces horizontal torque on the roots and thus transfer occlusal forces along the long axis of the tooth.^[8] In our study, we used short metal copings which are relatively economic and prevent abutment fractures by distributing more of the occlusal load on the residual alveolar ridge and less on the abutment. In 1978, Rissin *et al.* did a comparative study and found that while chewing a food for a constant number of strokes, exert an equivalent amount of muscle effort but if chewed more slowly and efficiently produces better masticatory performance by producing an increased volume of fine food particles.^[9] Kapadia *et al.* compared about masticatory efficacy and claimed that there was no difference in masticatory efficiency by assessing the bite force, chewing efficiency, electromyographic (EMG) changes measured by EMG analysis, with tooth supported and implant supported overdentures.^[10] However, proper diagnosis, careful evaluation of the interocclusal distance, and treatment planning are very important factors for success of prosthesis.

CONCLUSION

Tooth-supported overdentures are still an excellent choice for considering of both economical and mechanical advantages using in both arches and can be applied in general dental practice. However, periodic follow up and proper maintenance of oral hygiene play essential role for the success of the prosthesis.

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